Invest in Innovation & Infrastructure

Actions & Recommendations from California Water Plan Update 2009

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California State government in partnership with others should invest in water innovation and infrastructure in support of integrated water management and sustainable outcomes.

Innovation investments:

- **Governance improvements** to promote more coordinated and integrated resources planning among State government agencies and with Regional collaboratives and Federal agencies that manage about 50 percent of the land in California
  - Recommendation #3 - Coequal goals for ecosystem health and water supply reliability
  - Recommendation #4 - State government role and responsibilities -- leverage collaborative, multi-organization venues like Strategic Growth Council and Delta Stewardship Council
  - Recommendation #8 - Review and revise roles and responsibilities -- use strategic planning tools like updating the Environmental Goals and Policy Report
  - Objective 3 (Conjunctive supply management) - Action 3
  - Objective 8 (Prevention, response & recovery planning) - Actions 4 & 5

- **Planning/Public Process improvements** to promote and incentivize communication, coordination and collaboration among water planners/managers, land use planners/decision-makers, and other resource managers at the regional and watershed scale (example -- IRWM)
  - Recommendation #6 - Improve coordination of land use, water, and resources planning and management
  - Objective 1 (IRWM) - Actions 1, 2 & 3
  - Objective 3 (Conjunctive supply management) - Actions 1, 2, 4 & 9
  - Objective 4 (Water quality) - Actions 4 & 5
  - Objective 5 (Environmental stewardship) - Approach (Vol. 1, page 7-21)
  - Objective 6 (Integrated flood management) - Actions 2 & 3
  - Objective 8 (Prevention, response & recovery planning) - Actions 1, 2 & 3
  - Objective 10 (Data & analysis) - Action 6 (Shared Vision Planning)
  - Objective 12 (Tribal resources) - Actions 4 through 12
  - Objective 13 (Equal access) - Actions 1, 2, 4, 5 & 6

- **Information technology improvements** to promote and incentivize water data collection, management, distribution, access, and exchange/sharing; and analytical methods
  - Recommendation #9 - Expand public water education and campaigns
  - Objective 10 (Data & analysis) - Actions 8 & 10 (Water Planning Information Exchange – Water PIE)
  - Objective 12 (Tribal resources) - Actions 1, 2 & 3
  - Objective 13 (Equal access) - Action 3

- **Research & Development** to advance, improve and commercialize new water/energy technologies (example -- CEC's PIER Program and CCST's water initiative), improve data collection & exchange, and develop analytical tools for integrated water management (example -- SWAN is partnering with academic institutions & consulting firms)
  - Recommendation #5 - Climate adaption and mitigation

- Objective 5 (Environmental stewardship) - Action 6
- Objective 6 (Integrated flood management) - Action 1
- Objective 10 (Data & analysis) - Actions 1, 3, 4, 5, 7, 9
- Objective 11 (Water technology) - Actions 1, 2, and 3 (across disciplines, resources and State agencies)

Infrastructure investments:

- **Regional projects** included in IRWM Plans and/or its component plans (these projects would include different mixes of the Water Plan's 27 resource management strategies depending on the region/location)
  - Objective 2 (Water efficiency and reuse) - Actions 3, 4, 5, 6 (highest priority for recycling projects using wastewater discharges that are near the coast and salt sinks), and 7 (Urban runoff and Ag drainage management)
  - Objective 3 (Conjunctive supply management) - Action 8 (new groundwater management tools)
  - Objective 4 (Water quality) - Actions 1, 2 & 3
  - Objective 5 (Environmental stewardship) - Actions 1 & 2
  - Objective 6 (Integrated flood management) - Action 6
  - Objective 9 (Water-energy nexus) - Actions 1, 2, 3, 4 & 5

- **Inter-regional projects** that would benefit two or more regions. The IRWM grant program has included funding for inter-regional projects, but we can use more
  - Example – see Mokelumne River Forum and Integrated Regional Conjunctive Use Project, (Volume 1, Chapter 4, Box 4-13, page 4-51)
  - Objective 5 (Environmental stewardship) - Actions 3 & 4
  - Objective 6 (Integrated flood management) – Actions 2 & 4
  - Objective 7 (Sustainable Delta management) - All Actions

- **Statewide systems** for water, flood, water quality, and wastewater management that provide public benefits (like CVFP facilities)
  - Recommendation #7 - Reoperate, renovate, and improve aging infrastructure
  - Objective 3 (Conjunctive supply management) - Action 10
  - Objective 5 (Environmental stewardship) - Actions 1, 2, 5, 6 & 7
  - Objective 6 (Integrated flood management) - Actions 4 & 5

Regarding investments and funding

State government investments should focus on the innovation improvements -- with or without federal or local cost share – and at the same time provide seed money to incentivize infrastructure improvements that leverages federal and local funding. The level of State government investment in infrastructure should be linked to the level of public benefits they provide (example -- the California Water Commission is to work on criteria & methods for evaluating public benefits of storage projects).

- Recommendation #2 -- California needs to develop and agree on more sustainable funding strategies and sources of revenue than just relying on the General Fund and periodic Water Bonds. The Legislature grappled with this a few years ago on what was called the Water Resources Investment Fund. They decided to table the bill and have not yet taken up the discussion again. Several State initiatives are now grappling with this issue (example – the Delta Stewardship Council needs to generate revenues and the Water-Energy Climate Action Team (WETCAT) is looking at a Public Goods Charge to help implement AB 32).

  DWR is facilitating a work group on financing strategies as part of Water Plan Update 2013.

- Objective 9 (Energy-water nexus) - Action 6 (Public Goods Charge)

- Volume 2 RMS Recommendations -- a number of the recommendations for the 27 resource management strategies cover investment and funding needs (see Table 1-1, Volume 2, Ch 1 for cost estimates through 2030)

Summary of Total and Average Annual Cost Estimates for Innovation & Infrastructure

Activity	**Accumulated Cost Through 2030** ($Billions)	**Average Annual Cost** ($Millions/year)	**Notes**
Innovation (Essential Support Activities)	1 - 3	50 - 150	State government should cover these costs
Infrastructure (assume 20% public share)	30 - 100 (6 - 20)	1,500 - 5,000 (300 - 1,000)	Paid by regional beneficiaries with State & federal cost share for public benefits

Regarding implementation

- State government should leverage multi-organization collaboratives like the Strategic Growth Council, Delta Stewardship Council, Ocean Protection Council, Water Plan State Agency Steering Committee, Conservancies, and California Council on Science & Technology to coordinate, align & implement State water policies and promote Integrated Resource Management --- without moving or blowing up boxes.
- State government should use a mix of legislation, regulation, guidelines, technical & data support, financial incentives & recommendations to advance integrated water management at a regional level.
- State government should recognize regional diversity by assisting, enabling & empowering *regional water collaboratives* to determine how state water policies are implemented.
- State government should (1) set the needed outcomes (goals, objectives and guidelines) in legislation, regulations, and its various water resource management plans; and then (2) direct the *IRWM Regional Water Management Groups (RWMG)* to determine the mix of resource management strategies they will use to meet State outcomes, and submit their implementation and finance plans describing how they will implement the strategies/actions.
- State government should recommend or direct two or more RWMGs to work together to also develop inter-regional strategies & infrastructure when it would help meet State water policies.
- State government should recommend or direct multiple RWMGs to invest in resource management strategies and infrastructure of statewide significance -- if and to the extent that they rely on and benefit from the strategy (example -- investing in Delta ecosystem restoration and improving upper watershed management such as meadow restoration).

Caution -- Listed actions would need new authorization and/or funding. Under each category above, the actions are presented in the order they appear in Update 2009.

Table 1-1 Strategy summary table

Reduce Water Demand

Strategy	Potential Strategy Benefits[1] — Provide Water Supply Benefit MAF/year - Applied Water	Improve Drought Preparedness	Improve Water Quality	Operational Flex & Efficient	Reduce Flood Impacts	Environmental Benefits	Energy Benefits	Recreational Opportunities	Reduce GW Overdraft	Accumulated Cost by 2030 ($ Billions)[2]
Agricultural Water Use Efficiency	0.1 - 1.0[3]	✸	▮	⇄		🐟			▦	0.3 - 5.0
Urban Water Use Efficiency	1.2 - 3.1	✸	▮	⇄		🐟	🔌		▦	2.5 - 6.0

Improve Operational Efficiency & Transfers

Strategy	Potential Strategy Benefits[1] — Provide Water Supply Benefit MAF/year[2]	Improve Drought Preparedness	Improve Water Quality	Operational Flex & Efficient	Reduce Flood Impacts	Environmental Benefits	Energy Benefits	Recreational Opportunities	Reduce GW Overdraft	Accumulated Cost by 2030 ($ Billions)[2]
Conveyance—Delta	N/A	✸	▮	⇄	⌂	🐟		🚤	▦	1.2 - 17.2
Conveyance—Regional/Local	N/A	✸	▮	⇄	⌂	🐟		🚤	▦	N/A
System Reoperation	N/A	✸	▮	⇄	⌂	🐟	🔌		▦	N/A
Water Transfers	N/A	✸		⇄		🐟				N/A

Increase Water Supply

Strategy	Potential Strategy Benefits[1] — Provide Water Supply Benefit MAF/year[2]	Improve Drought Preparedness	Improve Water Quality	Operational Flex & Efficient	Reduce Flood Impacts	Environmental Benefits	Energy Benefits	Recreational Opportunities	Reduce GW Overdraft	Accumulated Cost by 2030 ($ Billions)[2]
Conjunctive Management & Groundwater Storage	0.5 - 2.0	✸	▮	⇄	⌂	🐟			▦	N/A
Desalination – Brackish & Seawater	0.3 - 0.4	✸	▮	⇄		🐟			▦	2.0 - 3.0
Precipitation Enhancement	0.3 - 0.4						🔌			0.1 - 0.2
Recycled Municipal Water	1.8 - 2.3	✸	▮	⇄		🐟	🔌		▦	6.0 - 9.0
Surface Storage—CALFED	0.1 - 1.1	✸	▮	⇄	⌂	🐟	🔌	🚤		0.7 - 9.2
Surface Storage—Regional/Local	N/A	✸	▮	⇄	⌂	🐟	🔌	🚤		N/A

Improve Water Quality

Strategy	Potential Strategy Benefits[1] — Provide Water Supply Benefit MAF/year[2]	Improve Drought Preparedness	Improve Water Quality	Operational Flex & Efficient	Reduce Flood Impacts	Environmental Benefits	Energy Benefits	Recreational Opportunities	Reduce GW Overdraft	Accumulated Cost by 2030 ($ Billions)[2]
Drinking Water Treatment and Distribution	N/A		▮	⇄						1.4 / year
Groundwater/Aquifer Remediation	N/A		▮							20.0
Matching Quality to Use	N/A		▮	⇄		🐟				0.1
Pollution Prevention	N/A		▮		⌂	🐟	🔌	🚤	▦	21.0
Salt and Salinity Management	N/A		▮	⇄		🐟	🔌			>10.0
Urban Runoff Management	N/A		▮	⇄	⌂	🐟	🔌	🚤	▦	N/A

1. Actual resource management strategy benefits, e.g., reducing groundwater overdraft, will depend on how strategies are implemented.

N/A= Not Available

2. Additional information is found in Resource Management Strategies and Volume 5 Technical Guide.

3. Value is Net Water to account for water reuse among agricultural water users.

Table 1-1 Strategy summary table (continued)

Practice Resource Stewardship

Strategy	Potential Strategy Benefits[1] MAF/year[2]	Accumulated Cost by 2030 $ Billions[2]
Agricultural Lands Stewardship	N/A	5.3
Economic Incentives (Loans, Grants, Water Pricing)	N/A	N/A
Ecosystem Restoration	N/A	N/A
Forest Management[4]	0.1 - 0.5	0.3 - 0.8
Land Use Planning and Management	N/A	N/A
Recharge Area Protection	N/A	N/A
Water-dependent Recreation		N/A
Watershed Management	N/A	0.5 - 3.6

Improve Flood Management

Strategy	Potential Strategy Benefits[1] MAF/year[2]	Accumulated Cost by 2030 $ Billions[2]
Flood Risk Management	N/A	N/A

Other Resource Management Strategies

Objectives vary by strategy (see narratives in remainder of Volume 2)

Essential Support Activities to Integrate Strategies and Reduce Uncertainty

The following support activities are essential for successfully integrating packages of these resource management strategies. Compared with the costs of implementing the resource management strategies, the costs are relatively small for the essential support activities shown below (see Chapters 2 and 5 of Volume 1).

	Accumulated Cost by 2030 $ Billions[2]
Regional Water Management	0.25
Statewide Water Planning	0.17
Data & Tool Improvement	0.25
Research & Development	0.25
Science	3 - 5% of total

4. Numbers are for Meadow Restoration only.

N/A= Not Available

NOTE: The water supply benefits are not additive. Additional select unit cost information is found in Box 1-2 of Volume 2. Although presented individually, the resource management strategies are alternatives that can complement each other or compete for limited system capacity, funding, water supplies, or other components necessary for implementation. Assumptions, methods, data, and local conditions vary per strategy.